20 July 2017
College Park, MD

STEP UP 4 Women
Supporting Teachers to Encourage Pursuit of Undergraduate Physics for Women

Theodore Hodapp
APS Director of Project Development

Kathryne Woodle
Education and Diversity Program Manager
Fraction of Women Earning Undergraduate STEM Degrees

Source: National Center for Education Statistics and APS
Physics Degrees Awarded to Women

Source: National Center for Education Statistics and APS
Percentage of Women in Physics

Sources: NCES/IPEDS, AIP-SRC, HERI

High School: 50%
College Entrance: 20%
BS (degree): 25%
PhD (degree): 20%
Assistant Professor: 45%
Undergraduate Physics Degrees Awarded to Women

Hazari, Potvin, Lock, Lung, Sonnert, and Sadler, "Factors that affect the physical science career interest of female students: Testing five common hypotheses," PRST PER 9 020115 (2013)
CSWP Priorities

• **Increase the fraction of women in physics** by increasing the number who enroll in and complete undergraduate physics degrees.

• **Understand and implement solutions for gender specific issues** such as stereotype threat, unconscious bias, and impostor syndrome that impact careers of all physicists.

• **Enhance professional development** opportunities for women including negotiation skills, mentoring, and mentor training.

• **Encourage research into fundamental causes**, assess policies, and advocate actions to remedy issues that impact gender inequality in physics.
STEP UP for Women
Supporting Teachers to Encourage Pursuit of Undergraduate Physics for Women

NSF funding received May 2017 ($3M)

• Zahra Hazari, Geoff Potvin, Laird Kramer (FIU)
• Robynne Lock (TAMUC)
• Rebecca Vieyra (AAPT)
• Kathryn Woodle, Ted Hodapp, Crystal Bailey (APS)

This material is based upon work supported by the National Science Foundation under Grant Nos. 1621038, 1622510, 1346627

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.
STEP UP for Women
Supporting Teachers to Encourage Pursuit of Undergraduate Physics for Women

• 4+ year project; 3 Phases:
  • 2017-18: Pilot (10 Master teachers across the US)
  • 2018-19: Controlled study (26+ randomly selected in 3 states)
  • 2019-20: National rollout (15,000 teachers)

• Designing curriculum/classroom strategies for high school teachers to encourage women to study undergraduate physics:
  • Classroom strategies:
    • Personal recruiting
    • Public recognition of women in classroom
  • Lessons:
    • Discussion of underrepresentation
    • Discussion of careers in physics
STEP UP for Women
Supporting Teachers to Encourage Pursuit of Undergraduate Physics for Women

• Rollout (Phase 3): Pilot ideas in 2017, 2018
  • CUWiP workshops and “challenges”
  • Women in Physics Groups
  • SPS Chapters
  • National, state, and regional meetings for science teachers
  • Establish teacher networks
  • Develop Professional Development “lessons”
  • Website: tools, video, resources
  • Assessment: rate of adoption, problems of implementation, etc.
Quiz Time

- Think of one or more ideas to reach high school teachers with these ideas and lessons
  1) Idea
  2) Number of teachers who will adopt / year
  3) Cost?
  4) Will it continue to occur without prodding?
APS Conferences for Undergraduate Women in Physics (CUWiP)

US Female Physics Degrees

CUWiP Attendance

If you have any questions, please email women@aps.org

Indicates location of conference within regional area
Stereotype Threat

The experience of anxiety in a situation where a person has the potential to confirm a negative stereotype about their social group

• Math performance (Male vs. Female)
• Intelligence (Black vs. White)
• Memory (old vs. young)
Gender in Perceived Math Ability

Female and Male students given a difficult math examination. All students have high math ability.

- Half told it produces gender differentiated scores
- Half told it does not produce gender differentiated scores
Gender in Perceived Math Ability